



Peropteryx macrotis (Wagner, 1843) (Mammalia, Chiroptera, Emballonuridae), a newly recorded family, genus, and species of bat for Argentina

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Abstract

We add the family Emballonuridae to the bat fauna of Argentina, with the new record of a specimen of *Peropteryx macrotis* (Wagner, 1843) from Salta Province, increasing to five the number of families of bats in the country. The new locality extends the distribution of this species by 663 km south from its previously southernmost known record in Bolivia and 812 km to the southwest from its nearest occurrence in Paraguay. Although the new record is from within the Yungas ecoregion, the specimen was found in an urban area. The presence of Emballonuridae in Argentina was thought to be highly probable; the lack of records could be due to the methods used for capturing bats in Argentina, which are not very effective for the species of this family.

Keywords

Distribution, Salta Province, sheath-tailed bats, urban area.

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Introduction

In Argentina, 65 species belonging to four families of bats (Noctilionidae, Phyllostomidae, Molossidae, and Vespertilionidae) have been recorded to date (Barquez et al. 1999; Barquez 2006; Barquez and Díaz 2009; Díaz et al. 2016; Urquiza et al. 2017; Sánchez et al. 2019). In the summer of 2017, a specimen of *Peropteryx macrotis* (Wagner, 1843) (Emballonuridae) was collected in Salta Province, representing not only a new genus and species, but also a new family of bat for Argentina.

This species has a wide distribution in South Amer-

ica, reaching the central-eastern Bolivia and Paraguay. In some parts of its distribution this species can be abundant whereas in others, although less abundant, it may be widespread (Yee 2000). The presence of the family Emballonuridae in Argentina was expected by bat researchers, due to the proximity of its distribution in Bolivia, but the lack of records was probably a consequence of using mist-nets, which are the most used collecting method for bats in Argentina. Mist-nets are not effective for capturing members of this family, because these bats are high-flying aerial insectivores that move

mainly in the forest canopy and in open areas (Jung et al. 2014; Rodrigues Silva and Bernard 2017). However, when the mist-nets are placed near a shelter or foraging areas, emballonurid bats can be captured (Díaz and Linares García 2012).

Methods

The specimen of *Peropteryx macrotis* was found dead in a house within an urban area in Vaqueros (Salta Province). The complete specimen, skull included, was fixed in formaldehyde 10% and later preserved in alcohol 70%, and deposited at the Colección Mamíferos Lillo (CML), University of Tucumán, Tucumán, Argentina.

Vaqueros is located in the eastern slope of the of the Vaqueros Mountains (Garcia Melamed and Marmol 2010), and the ecoregion corresponds to the Yungas Forests (Burkart et al. 1999), a district of the Amazonian Domain of the Neotropical Region (Cabrera 1976). The climate of the Vaqueros area is mountainous subtropical with a dry season (Bianchi and Yáñez 1992). The average annual rainfall is 899.88 mm, and the average temperature is 16.3 °C, with the highest temperature of

21.3 °C in January and the lowest of 10.2 °C in July (Garcia Melamed and Marmol 2010).

The identification of the species was made using the keys published by Díaz et al. (2016) and descriptions published by Yee (2000) and Hood and Gardner (2008), as well as by comparison with specimens of this, and other species of the genus, deposited at the CML (see Appendix).

Results

New records. Argentina, La Calera Department, Salta Province: ciudad de Vaqueros (24°42'08"S, 065°24'29"W, 1253 m above sea level) (Fig. 1), collected by María Laura Lamas, summer 2017 (exact date unknown; December to March), in a house in an urban area, 1 adult female (CML 13318).

Identification. The characters that led us to recognize our specimen as an emballonurid were the presence of the first digit formed only by the metacarpal and the second digit with two phalanges (the second phalange longer than the first), the long calcar, and the short tail almost one-third of the length of body and which dorsally perforates the uropatagium. The specimen presented a wing

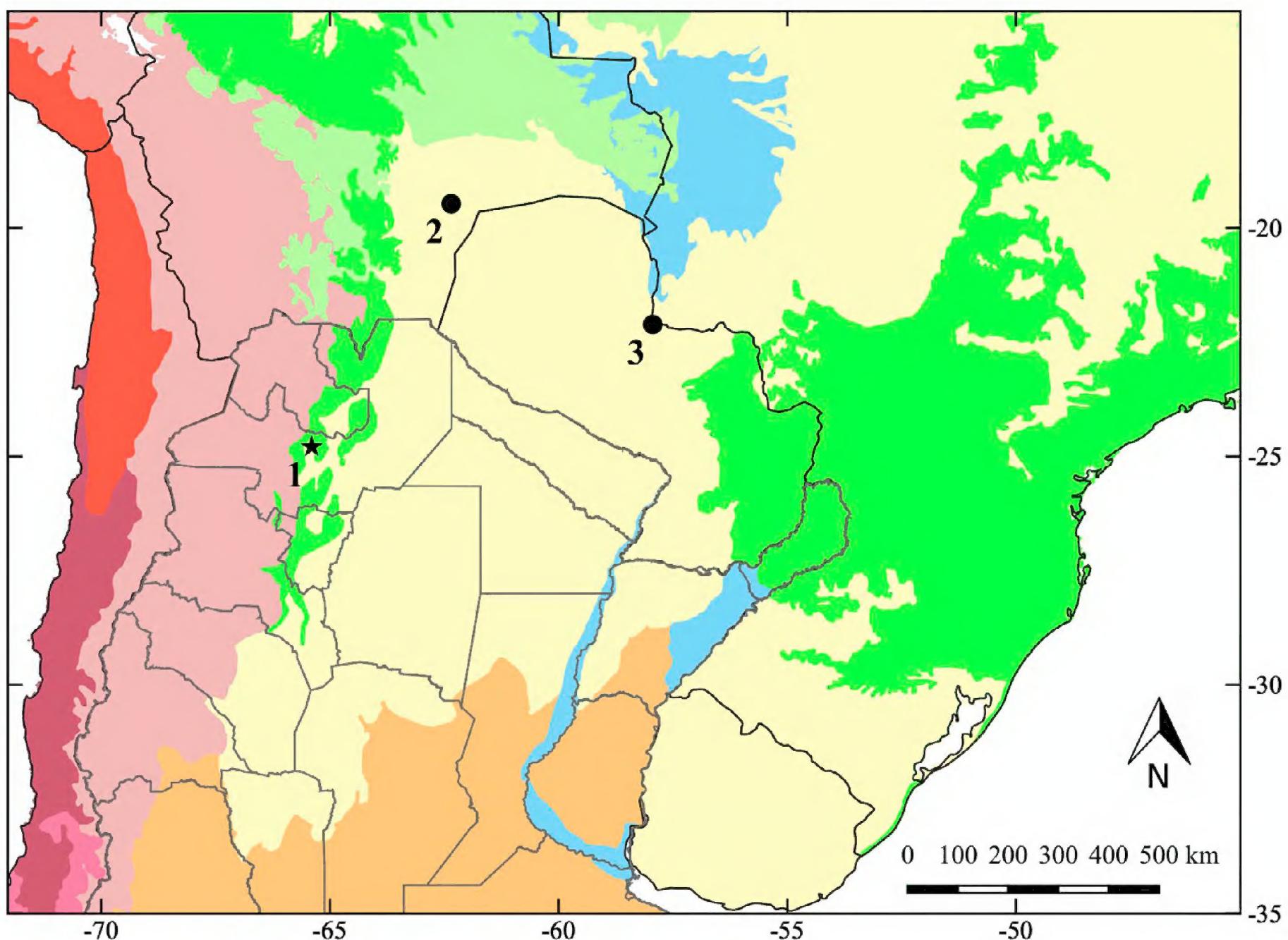


Figure 1. Southernmost points for the distribution of *Peropteryx macrotis* in Bolivia, Paraguay, and Argentina. Black dots indicate previous localities; star indicates the new one. 1 = Vaqueros (Salta, Argentina), 2 = Hacienda Cerro Colorado (Santa Cruz, Bolivia), 3 = Cantera 54, 1 km NE de San Lazaro (Concepción, Paraguay). Biomes classified according to Olson et al. (2001; available at <https://www.worldwildlife.org/publications/terrestrial-ecoregions-of-the-world>): ■ Desert and xeric shrublands; ■ Flooded Grasslands and Savannas; ■ Mediterranean Forest, Woodlands, and Scrub; ■ Montane Grasslands and Shrublands, Temperate Broadleaf and Mixed Forests; ■ Temperate Grassland, Savannas, and Shrublands; ■ Tropical and Subtropical Dry Broadleaf Forests; ■ Tropical and Subtropical Grasslands, Savannas, and Shrublands; ■ Tropical and Subtropical Moist Broadleaf Forests.



Figure 2. Dorsal view of the skin of *Peropteryx macrotis* (CML 13318).

sac located near the anterior border of the propatagium; broad ears, rounded at the tip, with the inner part lined with deep parallel crests, and a simple tragus; and the dorsal coloration without lines, all characteristics of the genus *Peropteryx* (Figs 2, 3). The brown coloration, forearm length of 41.6 mm, and the first upper premolar with cusps are diagnostic characters for *Peropteryx macrotis*. Other measurements (taken from the dried skin) were hindfoot length, 8.13 mm and ear length, 12.3 mm. The skull was not measured because it is included in the skin, due the preparation method used by the collector, but diagnostic characters of the incisors and premolars, were observed.

Peropteryx differs from other emballonurids genera by the size and location of the wing sac in the propatagium (Fig. 3A), which is absent in *Cyttarops*, *Centronycteris*, *Diclidurus*, and *Rhynchonycteris*; it differs from the genus *Saccopteryx* because in this the wing sac is located close to the forearm and near the elbow, has a complex and truncated tragus and two lines in the dorsal fur; in the genus *Balantiopteryx* the wing sac is in the center of the propatagium; finally, in the genus *Cormura* the wing sacs are long, narrow, and located at the middle of the propatagium, and the wings are attached to the metacarpals near the base of the toes, while in *Peropteryx* the wings are attached to the tibias near the ankles (Fig. 3C; Díaz et al. 2016).

In comparison with other species of the genus, *P. macrotis* can be distinguished from *P. leucoptera* and *P. pallidoptera* because they have pale and translucent wings; it differs from *P. kappleri* by its smaller size (forearm >47 mm in females and >45 in males in *P. kappleri*), and from *P. trinitatis* by the presence in this species of a peg-like first upper premolar that lacks the well-defined

anterior and posterior cusps (Simmons and Voss 1998; Yee 2000; Lim et al. 2010; Díaz et al. 2016).

Discussion

The nearest occurrences of *Peropteryx macrotis* to the new record in Argentina are Hacienda Cerro Colorado, Santa Cruz Department, Bolivia, and Cantera 54, 1 km northeast San Lazaro, Concepción Department, Paraguay. The Argentine specimen extends the distribution of the species by approximately 663 km south from Bolivia and 812 km southwest from Paraguay. Also, the new record represents the southernmost known occurrence for this species in the western part of its distribution. The southernmost known occurrence of *P. macrotis* is in Brazil, but in the eastern part of the distribution of the species (24°43'S, 047°33'W) (Vieira 1942).

Peropteryx macrotis is typical from the tropical deciduous forests, but it was also registered in semi-arid thorn scrubs (Willig 1983) and evergreen forests (Handley 1976); the closest localities in Bolivia and Paraguay belong to the Chaco eco-region (= Tropical and Subtropical Grasslands, Savannas, and Shrublands in Fig. 1). This species uses both natural shelters (limestone, coral and granite caves and hollow trees) and manmade structures (bridges, culverts, ruins, and buildings) (Yee 2000, Díaz 2011). The new Argentine specimen was collected in an urban area located in the Yungas Forest Ecoregion, representing the first record of the species for this ecoregion, although some specimens are known from other forests, such in the Amazon Basin (Lim et al. 2010; Díaz 2011).

The Yungas Forests (= Tropical and Subtropical Moist Broadleaf Forests in Fig. 1) are considered as one of the richest and most diverse areas in the world (Mittermeier et al. 1999). Today, it is severely impacted by

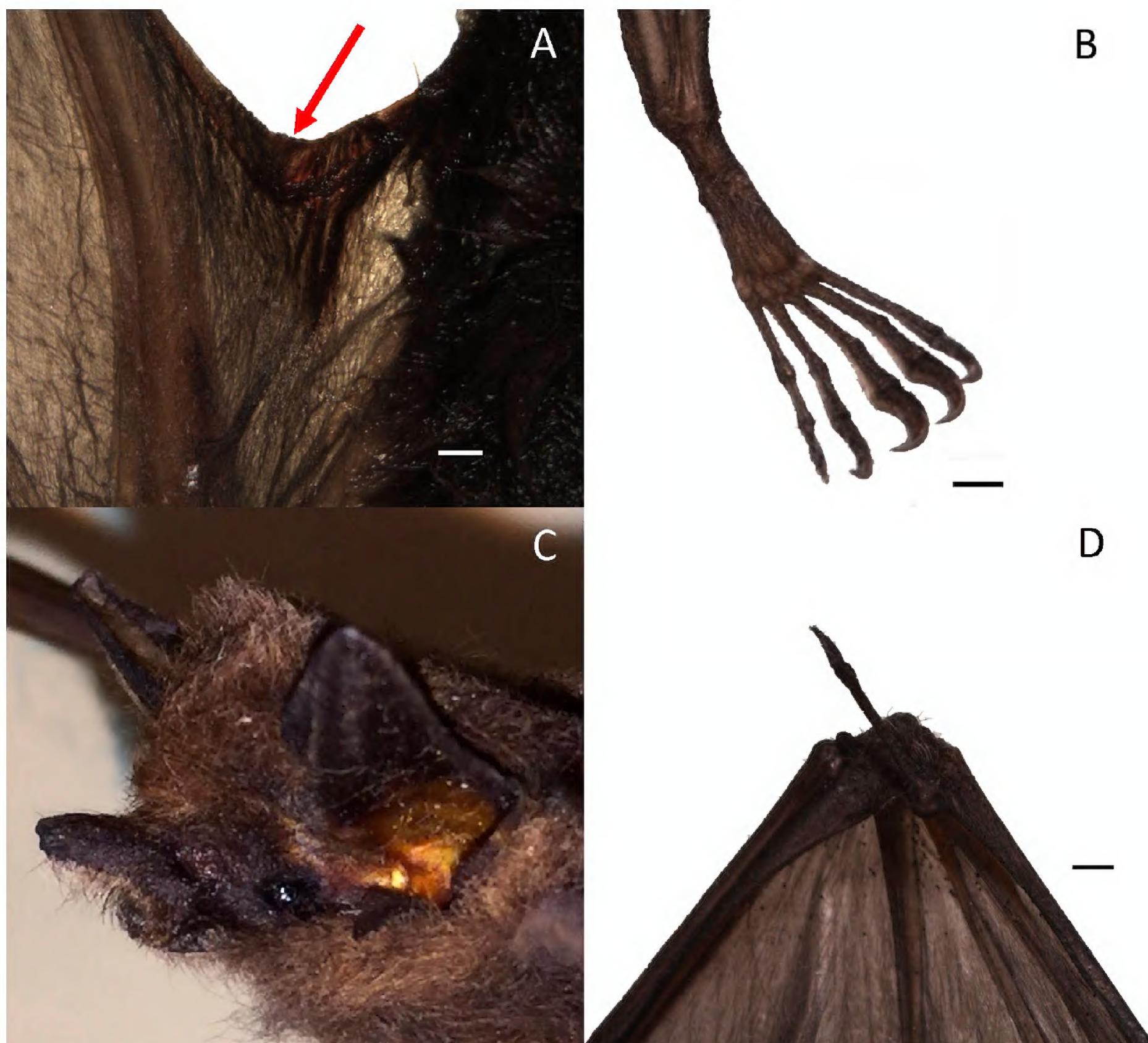


Figure 3. Details of the skin of *Peropteryx macrotis* (CML 13318). Dorsal view of the propatagium, the red arrow indicates the wing sac (A), dorsal view of hindfoot (B), lateral view of the rostrum (C), and ventral view of part of the wing and thumb (D). Scale bar = 1 mm.

human activities, and much of the original forested area has disappeared due to extensive livestock grazing, the advance of the agricultural frontier, and the development of landfills. Consequently, the region is considered threatened (Prado 1995).

In Argentina, this ecoregion is not continuous but fragmented, particularly between 24°S at the Bolivian border south to the 27°S in Catamarca Province; this ecoregion is penetrated by other phytogeographic units, especially of chacoan origin (Barquez and Díaz 2001). It is a fragile unit with only 4.2% of the area under some degree of protection by national parks or natural reserves (Brown et al. 2002) throughout northwestern Argentina. With respect to the bat fauna the Yungas represent one of the richest regions of Argentina, containing 65% of the total bat species known in the country (Díaz et al. 2016). Specifically, the area around Vaqueiros is subject to severe environmental pressures such as landfills and extensive raising of livestock, which represent serious problems (García Melamed and Marmol

2010). As a consequence, natural vegetation is almost entirely restricted to mountain slopes. The discovery of a previously unreported family of bats for the Yungas of Argentina provides additional evidence, which suggests the need to intensify urgent efforts to protect this endangered habitat and its fauna.

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Authors' Contributions

NMR, MRB, and JJMS participate in the preparation of the specimen; MMD and RMB reviewed and identified the specimen; MMD and RMB wrote the text.

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Appendix

Specimens examined. For each specimen, the localities are listed by country, alphabetically by province and department, then by specific site and coordinates between parentheses, numbers of specimens, collection acronym and number. The acronyms used in the text are CML (Colección Mamíferos Lillo), Tucumán, Argentina and MMD (personal catalogue of M. Mónica Díaz) for the specimen not yet entered in the CML catalog.

Peropteryx kappleri (1). Peru. Loreto: no specific locality, 1 (CML 13329).

Peropteryx leucoptera (1). Peru, Loreto, Maynas, San Lucas, W km 43 de la carretera Iquitos-Nauta (04°06' 14.76"S, 073°27'47.45" W), 1 (CML 13317).

Peropteryx macrotis (4). Argentina, Salta, Vaqueros (24° 42'08"S, 065°24'29"W), 1 (CML 13318). Bolivia, Santa Cruz, Chiquitos, San José de Chiquitos (17°50'03.25"S, 060°45'01.92"W), 3 (CML 1324, 1325, 1327).

Peropteryx pallidoptera (3) Peru, Loreto, Maynas, Camino a Paujil, 1.8 km al W del km 35 de la carretera Iquitos-Nauta (04°01'12.92"S, 073°26'47.20"W), 3 (CML 13319, 13320; MMD 3533).